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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,885	09/29/2003	Martin Heugel	59958 (70301)	6825
21874	7590	02/15/2006	EXAMINER	
EDWARDS & ANGELL, LLP P.O. BOX 55874 BOSTON, MA 02205			EWALD, MARIA VERONICA	
			ART UNIT	PAPER NUMBER
			1722	
DATE MAILED: 02/15/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/675,885

Applicant(s)

HEUGEL, MARTIN

Examiner

Maria Veronica D. Ewald

Art Unit

1722

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 12-24 is/are pending in the application.
- 4a) Of the above claim(s) 16-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9/29/03 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 9/03, 5/04, 6/04
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Drawings*

13. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because the figure labels and letters are not uniform, clean and well defined (of a generally poor quality) in each of the three figures (37 CFR 1.84(l)). Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Election/Restrictions***

14. Applicant's election with traverse of Group I in the reply filed on December 20, 2005 is acknowledged. The traversal is on the ground(s) that the examination of claims of both Groups I and II do not present an undue burden to the Examiner. However, this is not found persuasive because as stated in the requirement for election/restriction, claims 12 – 15 of Group I, drawn to an apparatus for making a three-dimensional object, are classified in Class 425, Subclass 174.4 while claims 16 – 24 of Group II, drawn to a method for making a three-dimensional object are classified in Class 264, Subclass 497. Because of the separate classification in the art, the Examiner has established burden, and thus, restriction is proper (MPEP 808.02). This requirement is therefore made FINAL.

***Claim Rejections - 35 USC § 103***

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 12 – 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mattes, et al. (U.S. 5,876,767) in view of Borstel, et al. (U.S. 6,512,781). Mattes, et al. teach a device for the layer-by-layer manufacture of a three-dimensional object by means of selective hardening at those sites of a layer of a building material that correspond to the cross-section of the object through the use of a laser (column 1, lines

Art Unit: 1722

58 – 60), the device comprising: a laser that provides radiation (item 5 – figure 1; column 2, lines 5 – 6); and a focusing unit that focuses the radiation to provide a focused beam (item 8 – figure 1; column 2, lines 7 – 8). However, Mattes, et al. do not teach that there is a beam expansion element or a switching element for changing the modal composition of the beam.

In a method to change the mode of a laser beam between Gaussian and ring modes, Borstel, et al. teach that there is a beam deflector and a control device (column 4, lines 20 – 23, 50 – 55). There are adaptive mirrors and a simple control device that allow the selective generation of the Gaussian mode or ring mode in the laser resonator (column 4, lines 48 – 50). To switch between the two modes, the gas laser employs the use of adaptive beam deflectors and one adaptive retro-mirror (column 4, lines 51 – 55). This reads on the Applicant's claims that the laser device be further comprised of a switching element for changing the modal composition of the laser radiation, wherein the switching element comprises at least one mode aperture and wherein the laser device be further comprised of a beam expansion element. The ability to switch between modal composition of the laser is especially important when the laser is used in Gaussian mode to focus on the smallest spot diameter and then is needed to switch to the ring mode when the laser can be aimed at a larger diameter focal spot (column 1, lines 20 – 27).

It would have been obvious at the time of the Applicant's invention to one of ordinary skill in the art to modify the apparatus of Mattes, et al. with the control element of Borstel, et al. for the purpose of being able to easily and quickly switch between the

Art Unit: 1722

Gaussian and ring modes depending on whether a small spot or larger spot diameter is being focused on by the laser beam as taught by Borstel, et al.

Claims 12 – 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith (U.S. 6,391,245) in view of Borstel, et al. (U.S. 6,512,781). Smith teaches a device for the layer-by-layer manufacture of a three-dimensional object by means of selective hardening at those sites of a layer of a building material that correspond to the cross-section of the object through the use of a laser (column 5, lines 50 – 55), the device comprising: a laser that provides radiation (column 3, lines 60 – 65); and a focusing unit that focuses the radiation to provide a focused beam (column 4, lines 1 – 5; column 6, lines 34 – 35). However, Smith does not teach that there is a beam expansion element or a switching element for changing the modal composition of the beam.

In a method to change the mode of a laser beam between Gaussian and ring modes, Borstel, et al. teach that there is a beam deflector and a control device (column 4, lines 20 – 23, 50 – 55). There are adaptive mirrors and a simple control device that allow the selective generation of the Gaussian mode or ring mode in the laser resonator (column 4, lines 48 – 50). To switch between the two modes, the gas laser employs the use of adaptive beam deflectors and one adaptive retro-mirror (column 4, lines 51 – 55). This reads on the Applicant's claims that the laser device be further comprised of a switching element for changing the modal composition of the laser radiation, wherein the switching element comprises at least one mode aperture and wherein the laser

Art Unit: 1722

device be further comprised of a beam expansion element. The ability to switch between modal composition of the laser is especially important when the laser is used in Gaussian mode to focus on the smallest spot diameter and then is needed to switch to the ring mode when the laser can be aimed at a larger diameter focal spot (column 1, lines 20 – 27).

It would have been obvious at the time of the Applicant's invention to one of ordinary skill in the art to modify the apparatus of Smith with the control element of Borstel, et al. for the purpose of being able to easily and quickly switch between the Gaussian and ring modes depending on whether a small spot or larger spot diameter is being focused on by the laser beam as taught by Borstel, et al.

Claims 12 – 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mattes, et al. (U.S. 5,876,767) in view of Borstel, et al. (EP 00118825.9). Mattes, et al. teach a device for the layer-by-layer manufacture of a three-dimensional object by means of selective hardening at those sites of a layer of a building material that correspond to the cross-section of the object through the use of a laser (column 1, lines 58 – 60), the device comprising: a laser that provides radiation (item 5 – figure 1; column 2, lines 5 – 6); and a focusing unit that focuses the radiation to provide a focused beam (item 8 – figure 1; column 2, lines 7 – 8). However, Mattes, et al. do not teach that there is a beam expansion element or a switching element for changing the modal composition of the beam.

In a method to change the mode of a laser beam between Gaussian and ring modes, Borstel, et al. teach that there is a beam deflector and a control device (items 7 and 8 – figure 1a). There are adaptive mirrors and a simple control device that allow the selective generation of the Gaussian mode or ring mode in the laser resonator (items 23 and 24 – figure 2a). To switch between the two modes, the gas laser employs the use of adaptive beam deflectors and one adaptive retro-mirror (items 21 – 23 – figure 2a). This reads on the Applicant's claims that the laser device be further comprised of a switching element for changing the modal composition of the laser radiation, wherein the switching element comprises at least one mode aperture and wherein the laser device be further comprised of a beam expansion element. The ability to switch between modal composition of the laser is especially important when the laser is used in Gaussian mode to focus on the smallest spot diameter and then is needed to switch to the ring mode when the laser can be aimed at a larger diameter focal spot. Examiner is noting that Patent Application No. EP 00118825.9 is an equivalent of U.S. 6,512,781.

It would have been obvious at the time of the Applicant's invention to one of ordinary skill in the art to modify the apparatus of Mattes, et al. with the control element of Borstel, et al. for the purpose of being able to easily and quickly switch between the Gaussian and ring modes depending on whether a small spot or larger spot diameter is being focused on by the laser beam as taught by Borstel, et al.

Claims 12 – 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith (U.S. 6,391,245) in view of Borstel, et al. (EP 00118825.9). Smith teaches a



Art Unit: 1722

device for the layer-by-layer manufacture of a three-dimensional object by means of selective hardening at those sites of a layer of a building material that correspond to the cross-section of the object through the use of a laser (column 5, lines 50 – 55), the device comprising: a laser that provides radiation (column 3, lines 60 – 65); and a focusing unit that focuses the radiation to provide a focused beam (column 4, lines 1 – 5; column 6, lines 34 – 35). However, Smith does not teach that there is a beam expansion element or a switching element for changing the modal composition of the beam.

In a method to change the mode of a laser beam between Gaussian and ring modes, Borstel, et al. teach that there is a beam deflector and a control device (items 7 and 8 – figure 1a). There are adaptive mirrors and a simple control device that allow the selective generation of the Gaussian mode or ring mode in the laser resonator (items 23 and 24 – figure 2a). To switch between the two modes, the gas laser employs the use of adaptive beam deflectors and one adaptive retro-mirror (items 21 – 23 – figure 2a). This reads on the Applicant's claims that the laser device be further comprised of a switching element for changing the modal composition of the laser radiation, wherein the switching element comprises at least one mode aperture and wherein the laser device be further comprised of a beam expansion element. The ability to switch between modal composition of the laser is especially important when the laser is used in Gaussian mode to focus on the smallest spot diameter and then is needed to switch to the ring mode when the laser can be aimed at a larger diameter focal spot. Examiner is noting that Patent Application No. EP 00118825.9 is an equivalent of U.S. 6,512,781.

Art Unit: 1722

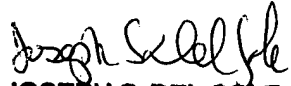
It would have been obvious at the time of the Applicant's invention to one of ordinary skill in the art to modify the apparatus of Smith with the control element of Borstel, et al. for the purpose of being able to easily and quickly switch between the Gaussian and ring modes depending on whether a small spot or larger spot diameter is being focused on by the laser beam as taught by Borstel, et al.

### ***Conclusion***

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Veronica D. Ewald whose telephone number is 571-272-8519. The examiner can normally be reached on M-F, 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
**JOSEPH S. DEL SOLE**  
**PRIMARY EXAMINER**  
2/9/06

MVE